

25 of U.S. Patent 5,734,470 (Rogers-I) in view of U.S. Patent 5,394,415 (Zayhowski). Claims 1-13, 15-19, 21-34 and 45 were also rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 and 19-33 of U.S. Patent 5,812,261 (Nelson et al.) in view of Zayhowski. Claims 1-34 and 45 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent 5,546,881 (Rogers-II) in view of Zayhowski. Claims 35-44 and 46 were rejected as being unpatentable over Rogers-II, Zayhowski in view Nelson et al., and Journal of Applied Physics 2 (1982).

Applicants respectfully submit that the claims are allowable for at least the following reasons.

Claim 1 is directed to an apparatus for measuring a property of a structure. The apparatus includes a microchip laser that generates an optical pulse, a diffractive element that receives the optical pulse and diffracts it to generate at least two excitation pulses and an optical system that receives at least two optical pulses and spatially and temporally overlaps them on or in the structure to form an excitation pattern that launches an acoustic wave, electronic response, or thermal response that modulates at least a portion of the structure. The apparatus also includes a light source that produces a probe beam that **reflects** off the portion of the structure to generate a signal beam, an optical detection system

that receives the signal beam and in response generates a light-induced electrical signal, and an analyzer that analyzes the light-induced electrical signal to measure the property of the structure.

One advantageous feature as recited in Claim 1, as well as in the other independent Claims 35, 45 and 46, is the detection of a refracted signal beam (as opposed to the detection of a diffracted signal beam). For example, data collection in the reflection mode geometry are optimized when the peaks and null of the grating are stationary relative to the focused probe beam. Applicants have discovered that when a small scale microchip laser (as recited in the independent claims) is used in conjunction with a reflective mode (as also recited in the independent claims), the signal-to-noise ratio of data collection is increased. This, in turn, improves the precision and accuracy to which a sample is measured. (See page 7, lines 9-21, of the specification).

One of ordinary skill in the art will appreciate that the detection and analysis of refracted verse diffracted signal beams are different. In reflective mode, accurate measurements are made by fixing the phase of the excitation pattern (see element 15 in Fig. 4) relative to the probing area so that spatial jitter between these components is minimized. As discussed above, this is accomplished by the apparatus defined

by Claim 1, in part, by the use of the microchip laser and detection of reflected signal beams.

Nothing has been found in Rogers-I, Rogers-II, Nelson et al. or Zayhowski that teaches or suggests using a microchip laser and detecting of a reflected signal beams as recited in Claims 1, 35, 45 and 46. For example, the abstracts of Rogers-I, Rogers-II and Nelson et al. clearly indicate that a diffracted signal is detected (i.e., a diffraction mode). Moreover, the claims of these references all refer to detection of a diffracted signal --not a reflected signal.

The Court of Appeals for the Federal Circuit has stated that:

The examiner must show reasons that the skilled artisan, **confronted with the same problems** as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

In Re Denis Bouffet, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (emphasis added).

Nothing has been found in the cited references that shows any recognition of the problems addressed by the claims of the present invention. In particular, the use of a microchip laser and a reflective mode geometry operation to produce the advantages discussed above.

Accordingly, at least for this reason, Claims 1, 35, 45 and 46 are believed patentable over Rogers-I, Rogers-II, Nelson et al. and Zaykowski, taken alone or in any combination.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the rejected independent claims. Those claims are therefore believed patentable over the art of record.

The other rejected claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

This Amendment After Final Rejection is believed clearly to place this application in condition for allowance and its entry is therefore believed proper under 37 C.F.R. § 1.116. In any event, however, entry of this Amendment After Final Rejection, as an earnest effort to advance prosecution and reduce the number of issues, is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached at the
telephone number given below.

Respectfully submitted,

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